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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/659,389	09/11/2003	Jiro Minabe	117109	3785

25944 7590 10/29/2004

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EXAMINER	
LAVARIAS, ARNEL C	

ART UNIT	PAPER NUMBER
2872	

DATE MAILED: 10/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/659,389	MINABE ET AL.	
	Examiner	Art Unit	
	Arnel C. Lavarias	2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 September 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *9/11/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings were received on 9/11/03. These drawings are acceptable.

Specification

2. The disclosure is objected to because of the following informalities:

Page 4, line 8-10- delete 'the recording spot is scanned, and the hologram is recorded in a recording layer of the optical recording medium' since it is a repeat of lines 7-8.

Appropriate correction is required.

Claim Objections

3. Claim 3 is objected to because of the following informalities:

Claim 3, line 7- 'n' should read 'm'.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1, 5-10, 14, 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawano et al. (U.S. Patent No. 6317404), of record, in view of Psaltis et al. (U.S. Patent No. 5987112).

Kawano et al. discloses an optical recording method and optical recording medium for recording a hologram (See Figure 4), wherein a recording spot is formed by intersecting reference light (See 2 in Figure 4) with signal light (See 1 in Figure 4) in which at least one of amplitude, a phase, and a polarization state (See 4 in Figure 4; col. 5, lines 52-58) has been spatially modulated according to information and a Fourier transform has been carried out with a lens system (See 7 in Figure 4), the recording spot is scanned and the hologram is recorded in a recording layer in an optical recording medium (See Figure 8), the recording method and medium comprising forming the recording spot by selectively using zero-order to low-order diffracted light components of a Fourier transform image of the signal light (See for example Figure 3A, 6A; 20 in Figure 4; col. 3, line 65-col. 5, line 15); and scanning the recording spot. Kawano et al. further discloses the reference light being a spherical reference wave and a hologram being multiply recorded by shift multiplexing (See Figure 8; col. 1, line 31-col. 2, line 36); the orders of the diffracted light components in the Fourier transform image are zero order through at least third order (See Figure 2; col. 4, lines 48-55); the optical recording medium being substantially in the form of a disk (See 35 in Figure 8); and the plurality of recording tracks being separated by a region where at least one of optical transmittance, reflectivity, and optical anisotropy is different from that of the recording track region (See col. 6, lines 14-25). Kawano et al. lacks setting a width of a plurality of recording tracks, which are arranged

in a direction crossed at right angles with a scanning direction of the recording spot in the recording layer, according to the order of the diffracted light component so as to be at least larger than a spread of the Fourier transform image corresponding to a maximum spatial frequency of the signal light. However, Psaltis et al. teaches a conventional holographic recording and reconstruction system (See for example Figure 5) for disk-shaped recording media, wherein the holographic information is recorded in a plurality of tracks on the recording medium (See for example Figure 7). The tracks are arranged in a direction crossed at right angles with a scanning direction of the recording spot in the recording layer. Additionally, the track width is set such that it is at least as wide or just slightly larger than the width of the spatial intensity distribution of the light, i.e. the spread of the Fourier transform image in the light, to be recorded onto the recording medium (See 100, 102, 104, 'TRACK N' in Figure 7). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to set a width of a plurality of recording tracks, which are arranged in a direction crossed at right angles with a scanning direction of the recording spot in the recording layer, according to the order of the diffracted light component so as to be at least larger than a spread of the Fourier transform image corresponding to a maximum spatial frequency of the signal light, as taught by Psaltis et al., in the recording method and medium of Kawano et al., for the purpose of reducing or eliminating cross-talk from adjacent holograms recorded in adjacent tracks.

6. Claims 2-3, 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawano et al. in view of Psaltis et al.

Kawano et al. in view of Psaltis et al. discloses the invention as set forth above in Claims 1 and 9, except for a width of the recording track satisfying a relationship expressed by $\frac{\lambda F}{d} \leq w \leq \frac{n\lambda F}{d}$, or more specifically $w \approx \frac{m\lambda F}{d}$. However, Kawano et al. additionally teaches that the spread of the Fourier transform image corresponding to the maximum spatial frequency of the signal light should ideally be approximately $0 \leq \xi \leq\approx \frac{n\lambda F}{d}$ (See col. 3, line 44-col. 5, line 15). Since the track width is ideally at least the same size or just slightly larger than the spread of the Fourier transform image, it would have been apparent to similarly have the width of the track be $0 \leq w \leq\approx \frac{n\lambda F}{d}$. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the width of the recording track satisfy a relationship expressed by $\frac{\lambda F}{d} \leq w \leq \frac{n\lambda F}{d}$, or more specifically $w \approx \frac{m\lambda F}{d}$, as taught by Kawano et al., in the recording method and medium of Kawano et al. in view of Psaltis et al., for the purpose of recording the holographic information in the smallest possible area, while maintaining a high signal-to-noise ratio for reading the holographic information out from the medium.

7. Claims 4 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawano et al. in view of Psaltis et al. as applied to Claim 1 above, and further in view of Curtis et al. (U.S. Patent No. 6163391).

Kawano et al. in view of Psaltis et al. discloses the invention as set forth above in Claims 1 and 9, except for the width of the recording track satisfying a relationship

expressed by the following formula where, in the optical recording medium, a surface on a lens side of the recording layer is arranged forward from a focal position of the lens system: $w \approx m\left(\frac{\lambda F}{d} + \left|\frac{1}{2F} - \frac{\lambda}{d}\right| y\right)$. However, Curtis et al. teaches a conventional method and apparatus for recording holographic data onto a recording medium (See for example Figure 1), wherein the recording medium may be placed in the path of the reference and object beam in such a manner that the recording surface is forward from the focal position of the Fourier transform lens (See 440, 427 in Figure 13). Additionally, given that the dimensions of the beam width of the object beam at the Fourier plane, the dimensions of the beam width of the object beam prior to focusing with the Fourier transform lens, the distance from the Fourier transform lens to the front surface of the recording medium, and the distance from the front surface of the recording medium to the focal position of the Fourier transform lens are all known, one of ordinary skill would have been able to perform the simple geometric calculations, and in particular calculations using the geometric concept of similar triangles, to determine the beam width, and hence the track width at the recording medium, to be $w \approx m\left(\frac{\lambda F}{d} + \left|\frac{1}{2F} - \frac{\lambda}{d}\right| y\right)$. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the width of the recording track satisfy a relationship expressed by the following formula where, in the optical recording medium, a surface on a lens side of the recording layer is arranged forward from a focal position of the lens system: $w \approx m\left(\frac{\lambda F}{d} + \left|\frac{1}{2F} - \frac{\lambda}{d}\right| y\right)$, as taught by Curtis et al., in the

recording method and medium of Kawano et al. in view of Psaltis et al., for the purpose of reducing or mitigating the sensitivity of the recording medium to shrinkage.

8. Claims 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawano et al. in view of Psaltis et al.

Kawano et al. in view of Psaltis et al. discloses the invention as set forth above in Claim 9, except for the plurality of recording tracks being provided in the form of either concentric circles or a spiral. However, it is well known in the art of holographic recording to record holographic data in the recording medium using recording tracks that are either in the form of concentric circles or in the form of a spiral. For example, Psaltis et al. additionally teaches that the holographic information to be recorded onto the recording medium is arranged in circular tracks (See for example Figure 7). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the plurality of recording tracks be provided in the form of either concentric circles or a spiral in the recording method and medium of Kawano et al. in view of Psaltis et al., to optimize the use of the available storage space of the holographic recording medium during multiplex recording.

9. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kawano et al. in view of Psaltis et al.

Kawano et al. in view of Psaltis et al. discloses the invention as set forth above in Claim 9, except for the optical recording medium being substantially in the form of a card. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the optical recording medium be substantially in the form of

a card, since it has been held that a mere change in shape of an element is generally recognized as being within the level of ordinary skill in the art when the change in shape is not significant to the function of the combination. Further, one would have been motivated to select the shape of a card to provide compatibility with existing recordable media technologies, such as identification cards, credit cards, licenses, etc.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent No. 6639700 to Suganuma.

Suganuma is being cited to evidence a conventional holographic recording medium and holographic recording and reproduction system (See for example Figures 1, 10-11, 26). In particular, the use of spiral and concentric tracks to record the holographic data onto the recording medium is noted (See Figures 10-11; col. 9, line 54-col. 10, line 13).

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arnel C. Lavarias whose telephone number is 571-272-2315. The examiner can normally be reached on M-F 8:30 AM - 5 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Arnel C. Lavarias
10/26/04

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